CLAIMS:

1. A method of manufacturing an electrical component, involving:

bonding a thin metal foil to an insulating substrate and thereby forming a component blank; and

laser machining at least the metal foil of said component blank to produce at least one trench for defining one or more foil tracks, said trench being at least equal in depth to the thickness of the foil so as to prevent current flow across the trench.

2. A method as claimed in claim 1, further comprising filling said trench with a trench filling material.

3. A method as claimed in claim 2, wherein said trench filling material is an insulating material.

4. A method as claimed in claim 2, wherein said insulating material is a polymer.

5. A method as claimed in claim 1, wherein said trench filling material is a dielectric material and said electric component is a sensor that responds to changes in said dielectric material.

6. A method as claimed in claim 1, wherein said electrical component is a foil sensor, further comprising forming said metal foil from a parent foil that is substantially identical with the material of the structure to be monitored.

7. A method as claimed in claim 1, further comprising laser machining said component blank to produce one or more back slots, said back slots being equal in depth to the full thickness of said component blank.

8. A method as claimed in claim 7, further comprising introducing a trench filling material into said trenches via said back slots.

9. A method as claimed in claim 1, further comprising preparing the metal foil by machining a sample of parent material to a desired final thickness.

10. A method as claimed in claim 9, comprising alternately machining both faces of the parent material until said final thickness is achieved.

11. A method as claimed in claim 1, further comprising preparing the metal foil for said bonding by applying a chemically resistant film to a first face of said foil, and dipping the other face of said foil in a bond enhancer, wherein said first face is ultimately the exposed face and said chemically resistant film protects said first face from said bond enhancer.

12. A method as claimed in claim 11, comprising drying said foil and then removing said film.

13. A method as claimed in claim 11, wherein said chemically resistant film comprises a polyester tape.

14. A method as claimed in claim 11, wherein said bond enhancer comprises a 1% silane solution.

15. A method as claimed in claim 1, wherein said insulating material is chosen to have an ablation rate that is sufficiently low to prevent unwanted penetration of the substrate during machining to remove said foil.

16. A method as claimed in claim 15, wherein said insulating substrate comprises a plurality of layers of

fibreglass prepreg.

17. A method as claimed in claim 1, wherein said electrical component is a foil sensor, the method comprises preparing said component blank by coating said component blank on the surface comprising the ultimate sensor side of said sensor blank with a chemically resistant coating solution, to protect said surface from contamination during sensor processing.

18. A method as claimed in claim 17, comprising drying said sensor blank after coating said sensor blank.

19. A method as claimed in claim 7, wherein laser machining said component blank comprises producing slots of approximately 150 μm length at 1.5 mm intervals.

20. A method as claimed in claim 4, wherein said polymer comprises an epoxy resin.

21. A method as claimed in claim 20, wherein said epoxy resin comprises EPOTHIN (TM) brand epoxy resin.

22. A method as claimed in claim 1, comprising laser machining said blank to form two different types of sensors.

23. A method as claimed in claim 1, wherein said electrical component is selected from the group of:

a linear polarisation resistance gauge;
a corrosion sensor;
a resistance sensor;
a non-destructive testing sensor;
a spiral inductor;
a delay line;
a capacitor; and
a sensor responsive to changes in a dielectric

material.

24. A method as claimed in claim 1, wherein the metal foil has a thickness in the range of 15 to 200 μm.

25. A method as claimed in claim 1, wherein the ratio of depth to width of the trench is in the range of 1:1 to 7:1 and the walls of the trench are substantially straight.

26. An electrical component produced according to the above method of any one of claims 1 to 25.

27. A foil sensor produced according to the method of claim 26.

28. An electrical component, comprising:

an insulating substrate;

a thin metal foil bonded to said insulating substrate; and

at least one laser machined trench for defining one or more foil tracks so as to prevent current flow across the trench, said trench being at least equal in depth to the thickness of the foil.

29. An electrical component as claimed in claim 28, wherein said trench is filled with a trench filling material.

30. An electrical component as claimed in claim 1, wherein said trench filling material is an insulating material.

31. An electrical component as claimed in claim 30, wherein said insulating material is a polymer.

32. An electrical component as claimed in claim 31,

wherein said polymer comprises an epoxy resin.

33. An electrical component as claimed in claim 32, wherein said epoxy resin comprises EPOTHIN (TM) brand epoxy resin.

34. An electrical component as claimed in claim 29 wherein said trench filling material is a dielectric material.

35. An electrical component as claimed in claim 28, wherein said electrical component comprises at least one of:

a linear polarisation resistance gauge;
a corrosion sensor;
a resistance sensor;
a non-destructive testing sensor;
a spiral inductor;
a delay line;
a capacitor; and
a sensor responsive to changes in a dielectric material.

36. An electrical component as claimed in claim 28, wherein said electrical component comprises two or more different types of foil sensors.

37. An electrical component method as claimed in claim 28, wherein the metal foil has a thickness in the range of 15 to 200 μm.

38. An electrical component as claimed in claim 28, wherein the ratio of depth to width of the trench is in the range of 1:1 to 7:1 and the walls of said trench are substantially straight.

39. An electrical component as claimed in claim 28,

wherein said substrate is formed of a material having a sufficiently low rate of ablation to prevent unwanted penetration of the substrate during machining.

40. An electrical component as claimed in claim 39, wherein said substrate comprises a plurality of layers of fibreglass prepreg.

41. An electrical component as claimed in claim 28, wherein said electrical component is a foil sensor and said metal foil from a parent foil that is substantially identical with the material of the structure to be monitored.

42. An electrical component as claimed in claim 28, comprising one or more back slots, said slots being equal in depth to the combined thickness of said foil and said substrate.

43. An electrical component as claimed in claim 42, wherein said slots are approximately 150 μm length at 1.5 mm intervals.